2020

FANS01371_Mechanical Engineering Tech - Tool and Die CVS Application (Title Modification)

Fanshawe College

Ontario College Quality Assurance Service
Service de l'assurance de la qualité des collèges de l'Ontario

Mechanical Engineering Technician - Tool & Die

Fanshawe College | APS # FANS01371 | MTCU # 51007
Ontario College Diploma | Funding requested - full-time

Purpose

Graduates of a Mechanical Engineering Technician diploma program carry out mechanical engineering functions in compliance with the pertinent legislation and established standards, policies and procedures within the scope of practice of the mechanical engineering technician. This Mechanical Engineering Technician – Tool & Die program is designed to also prepare students to work specifically in a modern tooling shop, with emphasis on providing the foundational machining skills used in industry. Students will have the opportunity to participate in two paid co-op placements, creating additional opportunities to advance their skills.

Admission

Ontario Secondary School Diploma (OSSD) or equivalent, mature student status

Occupational Areas

Mechanical Engineering Technologists and Technicians provide technical support and services or may work independently in mechanical engineering fields such as the design, development, maintenance and testing of machines, components, tools, heating and ventilating systems, geothermal power plants, power generation and power conversion plants, manufacturing plants and equipment. They are employed by consulting engineering, manufacturing and processing companies, institutions and government departments.

Mechanical Engineering Technologists and Technicians NOC 2232
According to the Ministry of Labour, Training and Skills Development, the job outlook rating (future demand) for this job is "above average" with projected change in employment levels from 2017 – 2021 to increase 3.1% - 4% over employment levels experienced during the years 2008-2016. Full-time employment is enjoyed by 73% of those in this National Occupational Classification and the median income is $73,695.

Machinists and Machining and Tooling Inspectors NOC 7231
According to the Ministry of Labour, Training and Skills Development job outlook rating (future demand) for this job is "average" with projected change in employment levels from 2017 - 2021: 4.1% - 5%. Approximately 30% of Ontario job are located in/near Toronto and the median income is $58,000.

Machining Tool Operators NOC 9417
According to the Ministry of Labour, Training and Skills Development job outlook rating (future

demand) for this job is “average” with projected change in employment levels from 2017 - 2021: 4.1% - 5%. Approximately 38% of Ontario job are located in/near Toronto and the median income is $49,000.

Laddering Opportunities

Students may ladder into the program upon completion of the Pre-Technology Ontario College Certificate.

Graduates interested in a supervisory role within an industrial setting may consider proceeding into the Engineering Technology Management Ontario College Graduate Certificate program. Graduates interested in management roles and/or owning their own business may consider advancing into any number of Business/Entrepreneurship Ontario College Certificates, Diplomas, Advanced Diplomas or Bachelor degrees. Courses within this program are aligned with the Level One curriculum standards of the Precision Metal Cutting Apprenticeship program, creating potential for graduates to be successful in writing exemption exams (once they are a registered apprentice). Students may also wish to carry-on into apprenticeships in Tool and Die Making (430A), General Machinist (429A) or Mould Making (431A)

Program VLOs

1. complete all work in compliance with current legislation, standards, regulations and guidelines
2. apply quality control and quality assurance procedures to meet organizational standards and requirements
3. comply with current health and safety legislation, as well as organizational practices and procedures
4. apply sustainability* best practices in workplaces
5. use current and emerging technologies* to support the implementation of mechanical engineering projects
6. interpret, prepare and modify mechanical engineering drawings and other related technical documents
7. contribute to the design and the analysis of mechanical components, processes and systems applying fundamentals of mechanical engineering
8. manufacture, assemble, maintain and repair mechanical components according to required specifications
9. verify the specifications of materials, processes and operations to support the design and production of mechanical components
10. contribute to the planning, implementation and evaluation of projects
11. develop strategies for ongoing personal and professional development to enhance work performance
12. analyze and solve mechanical problems by applying mathematics and fundamentals of mechanical engineering
13. Develop a plan for the building and assembly of tooling or dies to meet project specifications
14. Evaluate tooling or die component assembly procedures according to appropriate standards and

requirements to address routine organizational requirements

Curriculum

- **COMM-1004 - Language & Communication Skills 1** (Semester 1 - 45.00 hours)
  COMM-1004 provides the student with an opportunity to establish skills in reading, writing and editing documents for work-related and personal uses. Students will also practice important study/reading skills and apply grammar rules.
- **CADD-1060 - Computer Aided Design 1** (Semester 1 - 45.00 hours)
  This course is designed to introduce the student to two dimensional CAD (computer aided design) using 2D CAD software. Topics will include the setup of the user interface, file management, creating and editing two dimensional geometry, analyzing and editing of geometry to ensure compatibility for use in toolpaths and creating engineering drawings
- **DRAF-1056 - Blueprint Reading** (Semester 1 - 45.00 hours)
  This course introduces the student to mechanical blueprint reading. Topics covered will include lines, dimensioning, tolerances, types of projection and methods to interpret working drawings.
- **MECH-1075 - Conventional Machining Theory** (Semester 1 - 45.00 hours)
  This is an introductory metal machining theory course covering safety, metrology, drills, lathes, grinders and milling machines.
- **MACH-1130 - Conventional Machine Shop 1** (Semester 1 - 150.00 hours)
  This course will enable the student to produce machined metal parts to the specifications of a technical drawing, by means of safely operating milling machines, lathes, and surface grinders.
- **DEVL-1054 - Skills for Career Success** (Semester 1 - 30.00 hours)
  This course will cover topics in digital literacy, career management and workplace communication.
- **MATH-1212 - Mathematics for Trades 1** (Semester 1 - 30.00 hours)
  This introductory course will reinforce foundational math concepts and teach students the necessary mathematical skills to enable them to be successful in the trades programs.
- **MECH-1117 - Geometric Dimensioning & Tolerancing** (Semester 2 - 30.00 hours)
  This course is designed to introduce students to terms, definitions and concepts used in geometric dimensioning and tolerancing.
- **MATH-3087 - Mathematics for Trades 2** (Semester 2 - 30.00 hours)
  Building on Mathematics for Trades 1, this course will continue to teach students core numeracy skills such as measurement and calculation, money math, scheduling, budgeting and data analysis. Students will practice their numeracy skills based on work-related scenarios.
- **MACH-XXX1 - Trade Theory** (Semester 2 - 75.00 hours)
  This intermediate-level metal machining theory course covers topics in metrology, lathes, mills, grinders, metallurgy, EDM and the Machinery's Handbook.
- **MECH-1012 - Jig & Fixture Design** (Semester 2 - 30.00 hours)
  This is an introductory course in tool design that deals with basic jigs and fixtures used for metal machining. Sketching, drafting and CAD techniques will be applied.
- **MACH-XXX2 - Conventional Machine Shop 2** (Semester 2 - 150.00 hours)
  Building on Conventional Machine Shop 1, projects in this course will develop skills using lathes, mills, surface and cylindrical grinders and the application of concepts in metallurgy, metrology and mechanical assembly. Emphasis will be placed on close tolerances and finish grinding on components after the heat treat process. One of the machining projects will be a work holding jig

or fixture.

- **COOP-1020 - Coop Education Employment Prep** (Semester 2 - 6.00 hours)
  This workshop will provide an overview of both the Co-operative Education Consultants' and students' roles and responsibilities relative to the Co-operative Education Policy. It will provide students with employment preparatory skills specifically related to co-operative education work assignments and will prepare students for their work term.
- **Gen Ed - General Education Course** (Semester 2 - 45.00 hours) (General Edu Course) (Elective)
  General Education Course
- **Co-op Workterm - Co-op Workterm** (Semester 3 - 360.00 hours)
  Co-op Workterm
- **CADD-1066 - Solid Modelling** (Semester 4 - 45.00 hours)
  This course provides a basic understanding of how to design and modify 3D models using software designed to create mechanical parts. Students explore how to create and modify solid models. They will learn how to create 3D models from 2D geometry, create solid assemblies and engineering drawings. Hands-on exercises throughout the course demonstrate the modeling process using techniques that can be applied in industry.
- **MACH-3023 - Tool & Die Theory 1** (Semester 4 - 75.00 hours)
  This course introduces the basics of tool and die theory and design. The course applies sketching/CAD skills and basic die theory to allow the student to design various types of dies.
- **MACH-1116 - Computer Numerical Control - MILL** (Semester 4 - 45.00 hours)
  This course is designed to introduce the student to computer numerical control machining on milling machines and machining centres. The student will learn part programming using G-code format to produce parts. The student will produce numerous parts on a CNC machining centre.
- **MACH-XXX3 - Conventional Machine Shop 3** (Semester 4 - 150.00 hours)
  This course will continue to develop a greater range of skills using lathes, drills, mills, and surface grinders. Application of the concepts of metallurgy and metrology will continue to be emphasized. Finish surface grinding will be required after the heat treatment process.
- **Gen Ed - General Education Course** (Semester 4 - 45.00 hours) (General Edu Course) (Elective)
  General Education Course
- **MACH-3025 - Tool & Die Theory 2** (Semester 5 - 30.00 hours)
  This course builds on students' tool and die theory and design capabilities. The student will learn the fundamentals of bending dies, presses, press safety and die try-out procedures. Students will continue to practice sketching/CAD skills and basic die theory and to design various types of dies.
- **MACH-XXX4 - Conventional Machine Shop 4** (Semester 5 - 150.00 hours)
  This course covers the practical application of lathes, mills, drill presses, grinders, CNC, EDM, and Tool & Die operations. In the culminating project, the student will make a 3-stage progressive die.
- **MACH-1117 - Computer Numerical Control - Lathe** (Semester 5 - 30.00 hours)
  This course is designed to introduce the student to computer numerical control machining on lathes and turning centres. It will include topics such as the history and impact of computer numerical control on the tool & die shop, programming and part production
- **MATH-3019 - Technical Calculations** (Semester 5 - 30.00 hours)
  This applied mathematics course presents the students with problems in applied geometry as well as technical problems relating to right-angled, oblique and solid trigonometry
- **MANF-1007 - Computer Aided Manufacturing** (Semester 5 - 45.00 hours)
  This course is designed to introduce the student to computer aided manufacturing using the

MasterCAM software. The student review two dimensional drawing techniques and will learn programming techniques, verification and communication between software and machine tools. The student will post code to control the machine tool to be able to produce various components.

- **Gen Ed - General Education Course** (Semester 5 - 45.00 hours) (General Edu Course) (Elective)
  General Education Course
- **Co-op Workterm - Co-op Workterm** (Semester 6 - 360.00 hours)
  Co-op Workterm

VLO Mapping

Code	1	2	3	4	5	6	7	8	9	10	11	12	13	14
COMM-1004											X			
CADD-1060	X				X	X			X			X		
DRAF-1056	X	X		X	X	X	X		X				X	
MECH-1075	X	X	X			X	X			X	X		X	X
MACH-1130	X	X	X	X	X	X	X	X	X	X	X	X	X	X
DEVL-1054												X		
MATH-1212												X		
MECH-1117	X	X			X	X	X	X					X	X
MATH-3087												X	X	
MACH-XXX1	X	X	X		X	X				X			X	
MECH-1012	X	X	X		X	X	X			X			X	X
MACH-XXX2	X			X	X		X		X	X		X	X	X
COOP-1020											X			
Gen Ed														
Co-op Workterm	X		X								X			
CADD-1066	X	X		X	X	X	X			X			X	
MACH-3023	X	X	X	X	X	X	X	X	X			X	X	X
MACH-1116	X	X	X	X	X	X		X	X	X		X		X

MACH-XXX3	X		X		X			X	X				X	X
Gen Ed														
MACH-3025	X	X	X		X		X				X		X	X
MACH-XXX4	X	X	X	X	X	X	X	X	X	X		X	X	X
MACH-1117	X		X		X	X			X	X		X	X	X
MATH-3019									X			X	X	X
MANF-1007	X	X	X	X	X	X	X		X			X	X	X
Gen Ed														
Co-op Workterm	X		X								X			

EES Mapping

Code	1	2	3	4	5	6	7	8	9	10	11	12	13
COMM-1004	X	X				X	X	X	X	X	X		
CADD-1060				X	X	X				X	X		
DRAF-1056	X	X	X	X			X			X	X		
MECH-1075	X	X	X		X	X	X			X	X		
MACH-1130	X	X	X	X	X		X			X	X		
DEVL-1054	X	X		X	X	X	X	X	X	X	X		
MATH-1212			X	X			X						
MECH-1117	X		X		X					X	X		
MATH-3087			X	X			X						
MACH-XXX1	X	X	X		X		X			X	X		
MECH-1012	X			X	X		X				X		
MACH-XXX2	X	X	X	X	X	X				X	X		
COOP-1020	X	X				X	X	X		X	X		
Gen Ed													

Co-op Workterm													
CADD-1066	X	X		X	X	X							
MACH-3023	X	X	X	X		X	X			X			
MACH-1116	X		X	X		X			X	X	X		
MACH-XXX3			X	X						X	X		
Gen Ed													
MACH-3025	X	X	X	X	X		X			X			
MACH-XXX4					X		X			X			
MACH-1117	X		X		X	X				X			
MATH-3019	X	X	X	X	X		X			X	X		
MANF-1007	X		X		X	X	X			X	X		
Gen Ed													
Co-op Workterm													

Certification/Accreditation

Certification type:

There is no recognition (None exist)

Attachments

None

Contact Information

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